The Spectrum of Comet 1907 *d* (*Daniel*). By John Evershed.

Notwithstanding the very unfavourable conditions prevailing here during the south-west monsoon, attempts were made to photograph the spectrum of this comet on several occasions in August and September. Owing to the short intervals of time practically available for making exposures on the comet (three-quarters of an hour at most), it seemed necessary to use a spectrograph having the greatest possible light-efficiency. I therefore determined to try whether an objective prism spectrograph of short focal length could be successfully employed. On account of the almost constant presence of cloud, more or less thick, in the eastern sky, the results do not come up to expectation, but are perhaps of sufficient interest to place on record.

A prismatic camera was constructed with the two very perfect 60° prisms, of specially selected crown glass, which were successfully used at recent eclipses. The prisms have an effective aperture of 42 mm., and the photographically corrected lens has a focal length of about 600 mm. The instrument was attached to the 6-in. Cooke equatorial in the south dome of this observatory, the plane of dispersion being made parallel to a circle of declination. For guiding, a straight-edged bar was placed in the eyepiece of the finder attached to the equatorial, and this was made parallel to the diurnal motion. In making an exposure, the comet's nucleus was kept on the edge of the bar, and nearly in the centre of the field (defined by a cross-wire), by means of the slow-motion handles of the equatorial.

In the course of several weeks, about the time of the comet's maximum brightness, only three fairly favourable opportunities occurred. These were August 28, September 3, and September 15. The best result was obtained on the first-named date, with an exposure of half an hour. On September 3 the comet was obscured by cloud for about half the available time before daylight, and during this interval the opportunity was taken to photograph the spectrum of Procyon on the same plate, the star being brought to the edge of the bar in the eyepiece, but at a little distance from the centre of the field. In the plate exposed for twenty minutes on September 15, under apparently favourable conditions, no trace of the spectrum can be seen. This is probably due to the low altitude of the comet, for the spectrum of Regulus, then about 3° N. of the comet, is only faintly impressed on the plate. Wratten's "Drop Shutter" plates were used in all the trials.

In the spectrum of August 28 the most striking features shown are a pair of extremely bright lines in the ultra-violet, corresponding with the nucleus of the comet,* and a series of monochromatic images of the tail, having the following approximate wave-lengths :—

$$\lambda\ 358,\ 369,\ 378,\ 401,\ 426,\ 455.$$

* Owing to a slight drift of the comet in R.A., the images of the nucleus are linear.

These radiations are not specially bright in the comet's nucleus, but they extend from ·5° to 1·5° into the tail, whilst the above-mentioned bright lines seem to be confined to the region of the nucleus. Altogether 12 lines or groups of lines have been measured on this plate, and the wave-lengths determined graphically, using the 12 hydrogen lines from Hβ to Hν inclusive in the spectrum of Procyon and of Sirius to obtain the dispersion curve. In the spectrum of September 3, with Procyon photographed on the same plate, the pair of bright lines in the ultra-violet are seen to be a little more refrangible than Hζ (λ 3889); and as their distance apart corresponds with about 11 units in wave-length, there can be no hesitation in ascribing them to the cyanogen lines at λ 3871·5 and λ 3883·5. In this plate, however, the images are too faint for measurement.

In the table which follows are summarised the results of measures of the spectrum of August 28. As most of the spectral images on this plate are broad and ill-defined, I give in the second column the approximate limits of wave-length of each line or band; and in the third column the mean wave-length, or the positions of maximum brightness. In the fourth column is entered the length of tail in degrees which can be traced in each radiation. I can assign no origin for the radiations, which seem characteristic of the tail, except the band at λ 455, which, according to Campbell, may probably be due to cyanogen.* The continuous spectrum, which is faint throughout, ends at about λ 490.

No.	Limits of λ.	Mean λ.	Length of Tail in Degrees.	Probable Identification.	Remarks.
1	357	358±	·3±		
	359	...	...	Cyanogen ?	
2	367	369±	·4±	...	Exceedingly faint images of tail.
	370	...	...	...	
3	377	378±	·5±	...	
	380	...	...	...	
4	3863	3873	...	Cyanogen.	Very intense lines: 3884 the strongest in the whole spectrum.
5	3885	3884	·2	Cyanogen.	
6	3995	4015	1·6	...	
	4034	...	...	...	
7	...	4129±	...	...	Extremely faint traces of tail. Campbell gives a faint line at 4126 in comet *b* of 1893.
	...	...	...	...	
8	4190	4200	...	Cyanogen.	No tail. Traces of lines at these positions.
	4221	4215	...	Cyanogen.	

* *Pub. Ast. Soc. Pacific*, vol. v. p. 209.

No.	Limits of λ.	Mean λ.	Length of Tail in Degrees.	Probable Identification.	Remarks.
9	4239 } 4282 }	4260 ...	1·4 ...	... ...	A very faint line is given by Campbell at λ 426 in comet *b* of 1893.
10	...	4360	...	...	Faint bright spot in continuous spectrum. A bright line is given by Campbell at λ 4366 in comet *b* of 1893.
11	4523 } 4584 }	4553 ...	1·1 ...	Cyanogen ? ...	Campbell gives a band near λ 455 in comet *c* of 1893.
12	4650 } 4736 }	4682 ...	·4 ...	Blue band of carbon.	Max. brightness estimated at λ 4682.

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Note on the Ancient Solar Eclipses discussed by Mr. Cowell.

By A. C. D. Crommelin.

The results derived from these eclipses by Mr. Cowell are so important and far-reaching that it is desirable to remove all uncertainty as to possible errors, especially in view of the fact that Mr. Nevill published some results purporting to be deduced from the same formula, but inconsistent with those given by Mr. Cowell himself; I accordingly undertook an independent calculation of the six eclipses −1062, −762, −602, −584, −430 and +197, which are the most important and best authenticated ones. I obtain results practically identical with Mr. Cowell, the discordance in no case exceeding 2″, which is an absolutely negligible quantity.

Several smaller terms in latitude were then introduced, which had some slight effect on the residuals, but not enough to affect the argument in any way; they possibly produce a small diminution in the relative acceleration of the Sun and the node, but only to the extent of ½″ or less.

Two points suggest themselves as worthy of mention regarding the eclipse of −1062; viz.—(1) Mr. King's recently published book gives a translation of the inscription in which it occurs, which is a record of omens occurring in the city of Babylon (wild beasts entering the streets, dogs entering the temples, etc.); hence there